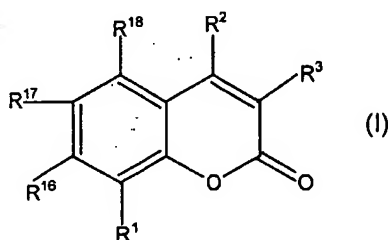


## Claims

### 1. Radiation-sensitive element comprising

- (a) an aluminum substrate which has been subjected to a pretreatment of electrochemical roughening and optionally subsequent anodizing and/or application of a hydrophilizing layer, wherein the electrochemical roughening is carried out with a hydrochloric acid electrolyte or an electrolyte essentially consisting of hydrochloric acid, and
- (b) a radiation-sensitive coating comprising
  - (i) at least one free-radical polymerizable monomer with at least one ethylenically unsaturated polymerizable group and at least one P-OH group,
  - (ii) at least one sensitizer of the formula (I),



wherein

$R^1$ ,  $R^{16}$ ,  $R^{17}$  and  $R^{18}$  are independently selected from -H, a halogen atom,  $C_1$ - $C_{20}$  alkyl, -OH, -O- $R^4$  and -NR<sup>5</sup>R<sup>6</sup>, wherein  $R^4$  is  $C_1$ - $C_{20}$  alkyl,  $C_5$ - $C_{10}$  aryl or  $C_6$ - $C_{30}$  aralkyl and  $R^5$  and  $R^6$  are independently selected from a hydrogen atom and  $C_1$ - $C_{20}$  alkyl,

or  $R^1$  and  $R^{16}$ ,  $R^{16}$  and  $R^{17}$  or  $R^{17}$  and  $R^{18}$  together form a 5- or 6-membered heterocyclic ring with a heteroatom selected from N and O in one or both positions adjacent to the phenyl ring,

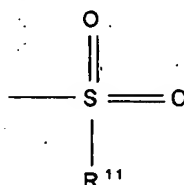
or  $R^{16}$  or  $R^{17}$  forms, together with each of its two adjacent substituents, a 5- or 6-membered heterocyclic ring with a heteroatom selected from N and O in one or both positions adjacent to the phenyl ring;

wherein each formed 5- or 6-membered heterocyclic ring can independently be substituted with one or more  $C_1$ - $C_6$  alkyl groups,

with the proviso that at least one of  $R^1$ ,  $R^{16}$ ,  $R^{17}$  and  $R^{18}$  is not hydrogen or  $C_1$ - $C_{20}$  alkyl,

$R^2$  is a hydrogen atom,  $C_1$ - $C_{20}$  alkyl,  $C_5$ - $C_{10}$  aryl or  $C_6$ - $C_{30}$  aralkyl and

$R^3$  is a hydrogen atom or a substituent selected from  $-\text{COOH}$ ,  $-\text{COOR}^7$ ,  $-\text{COR}^8$ ,  $-\text{CONR}^9\text{R}^{10}$ ,  $-\text{CN}$ ,  $C_5$ - $C_{10}$  aryl,  $C_6$ - $C_{30}$  aralkyl, a 5- or 6-membered heterocyclic group, a group  $-\text{CH}=\text{CH}-\text{R}^{12}$  and

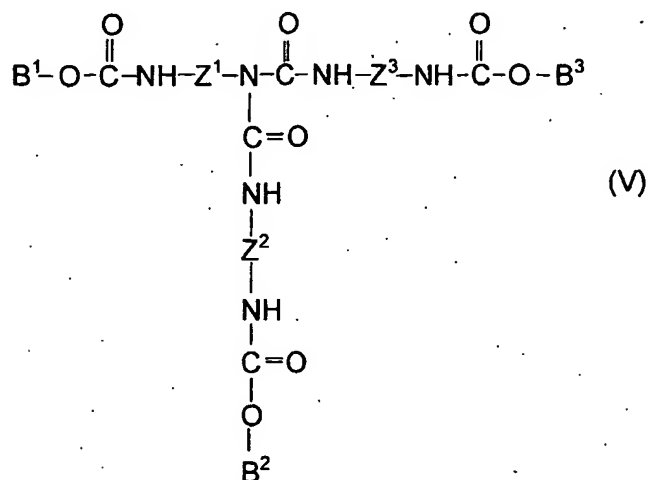


wherein  $R^7$  is  $C_1$ - $C_{20}$  alkyl,  $R^8$  is  $C_1$ - $C_{20}$  alkyl or a 5- or 6-membered heterocyclic group,  $R^9$  and  $R^{10}$  are independently selected from a hydrogen atom and  $C_1$ - $C_{20}$  alkyl,  $R^{11}$  is  $C_1$ - $C_{12}$  alkyl or alkenyl, a heterocyclic non-aromatic ring or  $C_5$ - $C_{20}$  aryl optionally with a heteroatom selected from O, S and N, and  $R^{12}$  is  $C_5$ - $C_{10}$  aryl or a 5- or 6-membered heterocyclic, optionally aromatic, ring;

or  $R^2$  and  $R^3$ , together with the carbon atoms to which they are bonded, form a 5- or 6-membered, optionally aromatic, ring;

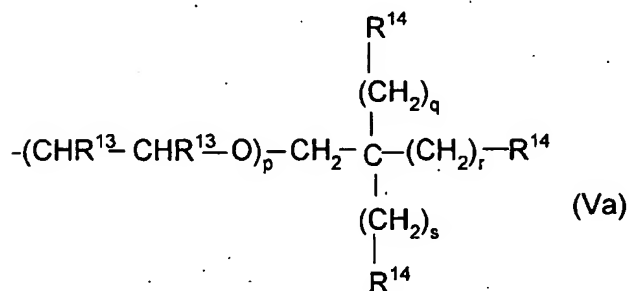
- (iii) at least one coinitiator selected from an onium compound, a hexaarylbiimidazole compound and a trihalogenomethyl compound;

(iv) at least one biuret oligomer of the formula (V)



wherein  $\text{Z}^1$ ,  $\text{Z}^2$  and  $\text{Z}^3$  are independently selected from  $\text{C}_2$ - $\text{C}_{18}$  alkanediyl and  $\text{C}_6$ - $\text{C}_{20}$  arylene,

$\text{B}^1$ ,  $\text{B}^2$  and  $\text{B}^3$  are independently selected from



wherein  $\text{R}^{13}$  is independently selected from a hydrogen atom and  $-\text{CH}_3$  and  $p = 0$  or an integer from 1-10, each group  $\text{R}^{14}$  is independently selected from a hydrogen atom, a group



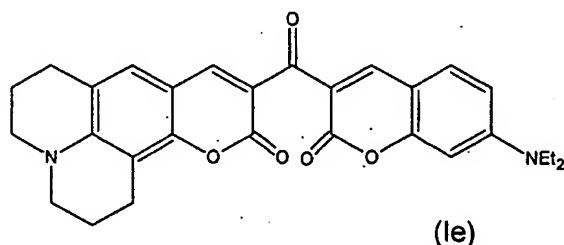
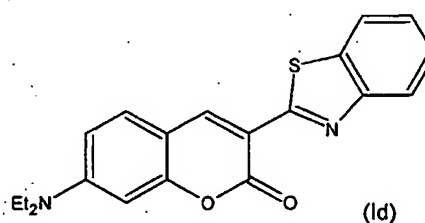
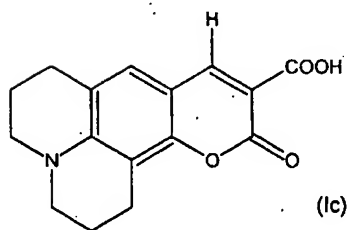
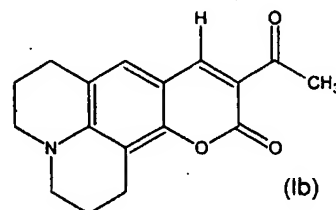
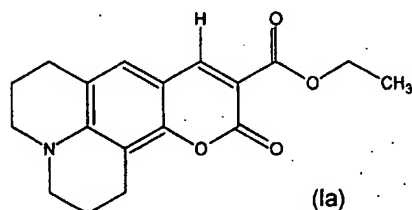
$\text{R}^{15}$  is a hydrogen atom or  $\text{C}_1$ - $\text{C}_{12}$  alkyl and

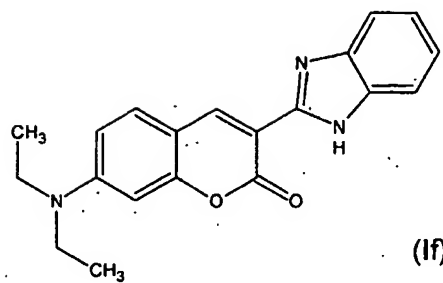
$q$ ,  $r$  and  $s$  independently of each other are 0 or 1,

with the proviso that in each group  $B^1$ ,  $B^2$  and  $B^3$  at least one  $R^{14}$  is not a hydrogen atom if  $B^1$ ,  $B^2$  and  $B^3$  all represent a group of the formula (Va), and

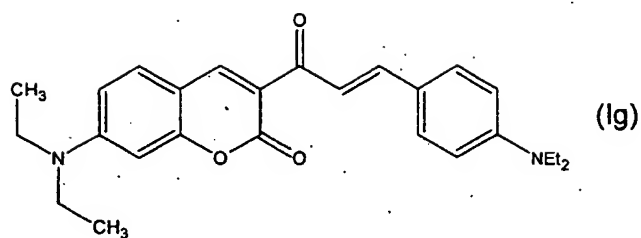
(v) optionally at least one metallocene.

2. Radiation-sensitive element according to claim 1, wherein the radiation-sensitive coating additionally comprises at least one further component selected from free-radical polymerizable monomers/oligomers/prepolymers that are different from component (i) of the radiation-sensitive coating, alkali-soluble binders, thermopolymerization inhibitors, dyes, plasticizers, chain transfer agents, leuco dyes, inorganic fillers and surfactants.
3. Radiation-sensitive element according to claim 1 or 2, wherein the sensitizer of the formula (I) is selected from the following compounds and mixtures thereof:

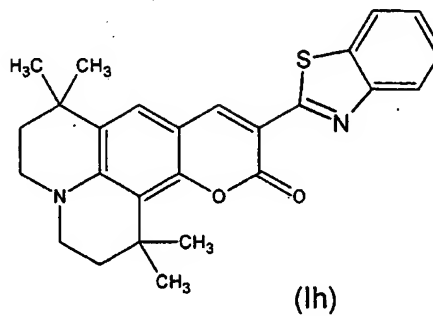




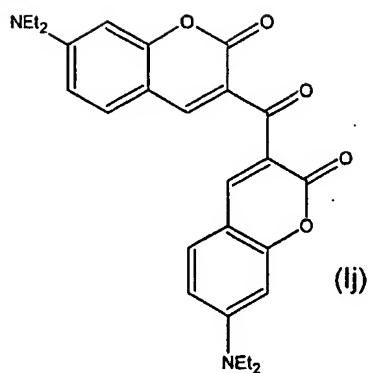
(If)



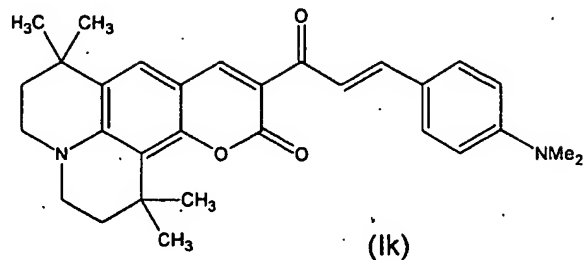
(Ig)



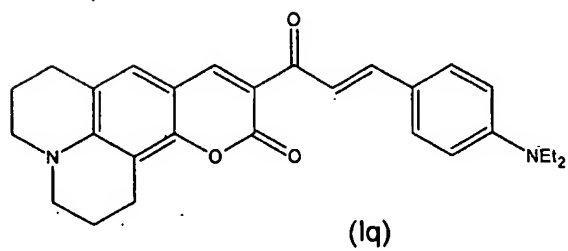
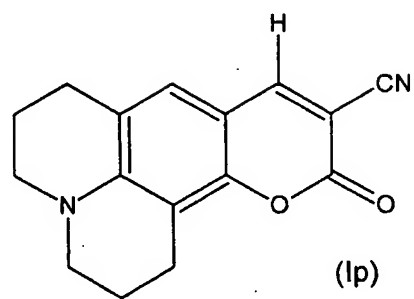
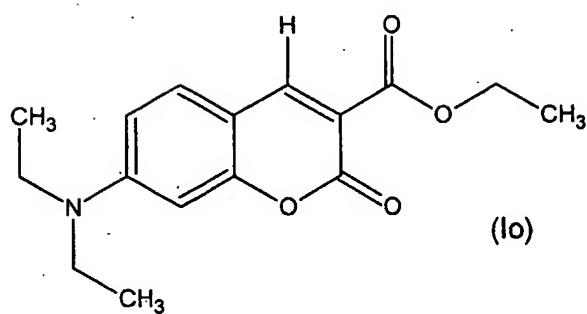
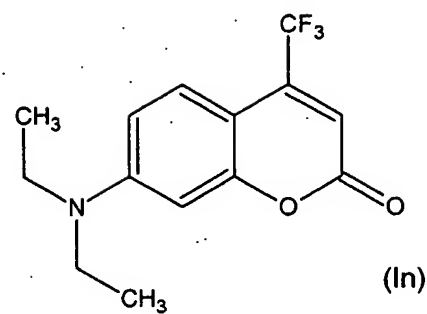
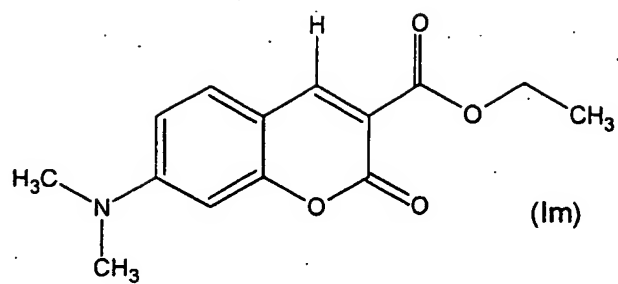
(Ih)



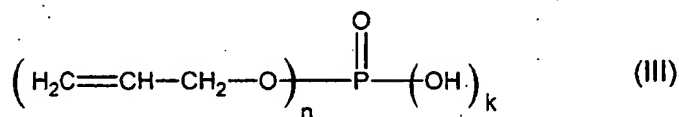
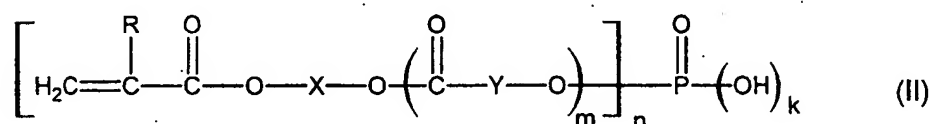
(Ij)



(Ik)



4. Radiation-sensitive element according any of claims 1 to 3, wherein the coinitiator is an iodonium salt or a hexaarylbiimidazole compound.
5. Radiation-sensitive element according to any of claims 1 to 4, wherein the radiation-sensitive coating comprises a metallocene with a metal of the fourth subgroup as a central atom.
6. Radiation-sensitive element according to any of claims 1 to 5, wherein the free-radical polymerizable monomer with at least one ethylenically unsaturated group and at least one P-OH group is represented by the following formula (II) or (III):



wherein n is 1 or 2,

m is 0 or 1,

k is 1 or 2,

n + k = 3,

R is a hydrogen atom or C<sub>1</sub>-C<sub>12</sub> alkyl,

X is C<sub>2</sub>-C<sub>12</sub> alkanediyl and

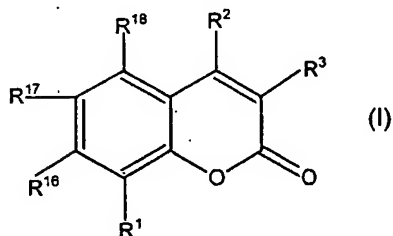
Y is C<sub>2</sub>-C<sub>12</sub> alkanediyl.

7. Radiation-sensitive element according to any of claims 1 to 6, wherein in the biuret of formula (V) Z<sup>1</sup> = Z<sup>2</sup> = Z<sup>3</sup>.
8. Radiation-sensitive element according to any of claims 1 to 7, wherein an oxygen-impermeable overcoat is provided on the radiation-sensitive coating.
9. Process for the production of an imaged element comprising

- (a) providing a radiation-sensitive element as defined in any of claims 1 to 8;
- (b) image-wise exposure of the element with radiation of a wavelength adjusted to the sensitizer present in the radiation-sensitive layer of the element;
- (c) optionally heating;
- (d) removing the unexposed areas with an aqueous alkaline developer; and
- (e) optionally heating the imaged element obtained in step (d) and/or subjecting it to overall exposure.

10. Radiation-sensitive composition comprising

- (i) at least one free-radical polymerizable monomer with at least one ethylenically unsaturated polymerizable group and at least one P-OH group,
- (ii) at least one sensitizer of the formula (I)



wherein.

$R^1$ ,  $R^{16}$ ,  $R^{17}$ , and  $R^{18}$  are independently selected from -H, a halogen atom,  $C_1$ - $C_{20}$  alkyl, -OH, -O- $R^4$  and -NR<sup>5</sup>R<sup>6</sup>, wherein  $R^4$  is  $C_1$ - $C_{20}$  alkyl,  $C_5$ - $C_{10}$  aryl or  $C_6$ - $C_{30}$  aralkyl and  $R^5$  and  $R^6$  are independently selected from a hydrogen atom and  $C_1$ - $C_{20}$  alkyl,

or  $R^1$  and  $R^{16}$ ,  $R^{16}$  and  $R^{17}$  or  $R^{17}$  and  $R^{18}$  together form a 5- or 6-membered heterocyclic ring with a heteroatom, selected from N and O, in one or both positions adjacent to the phenyl ring,

or  $R^{16}$  or  $R^{17}$  forms, together with each of its two adjacent substituents, a 5- or 6-membered heterocyclic ring with a heteroatom, selected from N and O, in one or both positions adjacent to the phenyl ring,

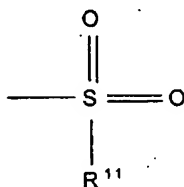


wherein each formed 5- or 6-membered heterocyclic ring can independently be substituted with one or more C<sub>1</sub>-C<sub>6</sub> alkyl groups,

with the proviso that at least one of R<sup>1</sup>, R<sup>16</sup>, R<sup>17</sup> and R<sup>18</sup> is not hydrogen or C<sub>1</sub>-C<sub>20</sub> alkyl;

R<sup>2</sup> is a hydrogen atom, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>5</sub>-C<sub>10</sub> aryl or C<sub>6</sub>-C<sub>30</sub> aralkyl and

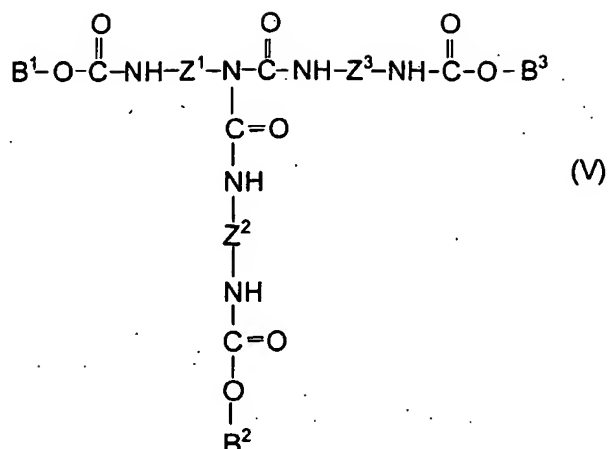
R<sup>3</sup> is hydrogen atom or a substituent selected from -COOH, -COOR<sup>7</sup>, -COR<sup>8</sup>, -CONR<sup>9</sup>R<sup>10</sup>, -CN, C<sub>5</sub>-C<sub>10</sub> aralkyl, a 5- or 6-membered heterocyclic group, a group -CH=CH-R<sup>12</sup> and



wherein R<sup>7</sup> is C<sub>1</sub>-C<sub>20</sub> alkyl, R<sup>8</sup> is C<sub>1</sub>-C<sub>20</sub> alkyl or a 5- or 6-membered heterocyclic group, R<sup>9</sup> and R<sup>10</sup> are independently selected from a hydrogen atom and C<sub>1</sub>-C<sub>20</sub> alkyl, R<sup>11</sup> is C<sub>1</sub>-C<sub>12</sub> alkyl or alkenyl, a heterocyclic non-aromatic ring or C<sub>5</sub>-C<sub>20</sub> aryl optionally with a heteroatom selected from O, S and N, and R<sup>12</sup> is C<sub>5</sub>-C<sub>10</sub> aryl or a 5- or 6-membered heterocyclic, optionally aromatic, ring;

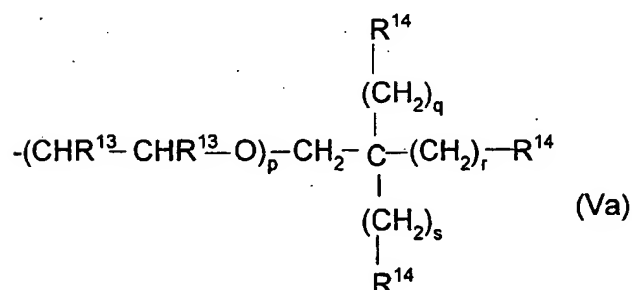
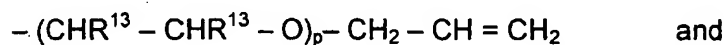
or R<sup>2</sup> and R<sup>3</sup>, together with the carbon atoms to which they are bonded, form a 5- or 6-membered, optionally aromatic, ring;

- (iii) at least one coinitiator selected from an onium compound, a hexaarylbiimidazole compound and a trihalogenomethyl compound;
- (iv) at least one biuret oligomer of the formula (V)

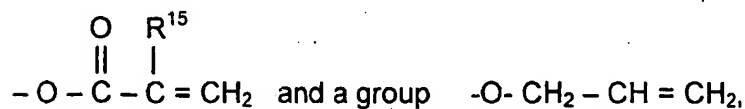


wherein  $\text{Z}^1$ ,  $\text{Z}^2$  and  $\text{Z}^3$  are independently selected from  $\text{C}_2\text{-C}_{18}$  alkanediyl and  $\text{C}_6\text{-C}_{20}$  arylene,

$\text{B}^1$ ,  $\text{B}^2$  and  $\text{B}^3$  are independently selected from



wherein  $\text{R}^{13}$  is independently selected from a hydrogen atom and  $-\text{CH}_3$  and  $p = 0$  or an integer from 1-10, each group  $\text{R}^{14}$  is independently selected from a hydrogen atom, a group



$\text{R}^{15}$  is a hydrogen atom or  $\text{C}_1\text{-C}_{12}$  alkyl and

$q$ ,  $r$  and  $s$  independently of each other are 0 or 1,

with the proviso that in each group B<sup>1</sup>, B<sup>2</sup> and B<sup>3</sup> at least one R<sup>14</sup> is not a hydrogen atom if B<sup>1</sup>, B<sup>2</sup> and B<sup>3</sup> all represent a group of the formula (Va), and

- (v) a solvent or solvent mixture; and
  - (vi) optionally at least one metallocene.
11. Radiation-sensitive composition according to claim 10, additionally comprising at least one further component selected from free-radical polymerizable monomers/oligomers/prepolymers that are different from component (i) of the radiation-sensitive composition, alkali-soluble binders, thermopolymerization inhibitors, dyes, plasticizers, chain transfer agents, leuco dyes, inorganic fillers and surfactants.
  12. Use of a radiation-sensitive composition as defined in claim 10 or 11 for the production of a radiation-sensitive element.
  13. Production of a radiation-sensitive element as defined in any of claims 1 to 8 comprising:
    - (a) providing an aluminum substrate which has been subjected to a pretreatment of electrochemical roughening and optionally subsequent anodizing and/or application of a hydrophilizing layer, wherein the electrochemical roughening is carried out with a hydrochloric acid electrolyte or an electrolyte essentially consisting of hydrochloric acid;
    - (b) applying a radiation-sensitive composition as defined in claim 10 or 11;
    - (c) drying; and
    - (d) optionally applying an oxygen-impermeable overcoat and drying.
  14. Printing form obtainable from the process according to claim 9.